Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
PANAMSAT LICENSEE CORP.	)	File No. SAT-LOA-19990812-00082
	)	SAT-AMD-20020111-0004
Application for Authority to Launch and Operate a Replacement C/Ku Hybrid Fixed Satellite Service Space Station at 95º W.L.	)	SAT-WAV-20020321-00026
	)	SAT-STA-20020404-00047

ORDER AND AUTHORIZATION

Adopted: May 29, 2002 **Released: May 30, 2002**

By the Chief, Satellite Division:

I. INTRODUCTION

1. By this Order, we grant PanAmSat Licensee Corporation ("PanAmSat") authority to launch and operate the Galaxy III-C satellite in the Fixed Satellite Service ("FSS") in the C and Ku-bands[1] to replace its Galaxy III-R satellite located at 95° W.L.[2] We also grant PanAmSat's request for a waiver of Sections 25.210(e) and 25.210(g)(2) of the Commission's rules to allow PanAmSat to employ circular polarization on some of its Ku-band transponders and to operate without all assigned frequencies being reused in beams serving widely separate areas. By this action we enable PanAmSat to ensure continuation of service to its customers and increased service reliability.

II. BACKGROUND

2. PanAmSat requests authority to launch and operate the Galaxy III-C satellite at the 95° W.L orbit location previously assigned to the Galaxy III-R satellite.[3] Galaxy III-C will

[1] The "conventional" C-band refers to the 3700-4200/5925-6425 MHz frequency bands. The "conventional" Ku-band refers to the 11.7-12.2 GHz/14.0-14.5 GHz frequency bands. Operation on C and Ku frequencies outside of these conventional C and Ku-band frequencies is referred to as "extended." Thus, the 6425-6675 MHz frequency band that PanAmSat proposes to use is referred to as an "extended" C-band frequency. The 11.45-11.7 GHz and 13.75-14.0 GHz frequency bands that PanAmSat proposes to use are referred to as "extended" Ku-band frequencies.

[2] We note that Galaxy III-C will also replace, in part, certain services available on the Galaxy VIII(I) satellite and serve as a substitute for the recently authorized Galaxy VIII(I(R) satellite. *See* Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to Marlene Dortch, Secretary FCC (May 17, 2002).

[3] *See Hughes Communications Galaxy, Inc.*, 3 FCC Rcd 6989 (Int'l Bur. 1988), modified in 7 FCC Rcd 7119 (Intl'l Bur. 1992).

replace the Galaxy III-R satellite that is reaching the end of its design life. PanAmSat states that the replacement of Galaxy III-R is also necessary because Galaxy III-R is operating on a backup satellite control processor ("SCP") as a result of a failure of its primary SCP. According to PanAmSat, deploying a satellite with two fully functioning SCPs will enhance service reliability.[4]

3. The Galaxy III-R satellite currently provides C-band service to the United States in the 3700-4200 and 5925-6425 MHz band, and Ku-band service in the 11.7-12.2 GHz and 14.0-14.5 GHz frequency bands that may be switched to either the United States or Latin America (*i.e.,* Mexico, the Caribbean, Central and South America).[5] When switched to the Latin America mode, the satellite's Ku-band downlink transponders use circular polarization.[6] PanAmSat proposes to operate the replacement Galaxy III-C satellite in these bands as well as to provide service in the extended C and Ku-bands, *i.e.* 6425-6675 MHz and 13.75-14.0 and 11.45-11.7 GHz[7]

4. PanAmSat also requests a waiver of Section 25.210(e) of the Commission's rules so that it may employ circular polarization on its extended and some of its conventional Ku-band transponders. Section 25.210(e) requires all satellites in the Fixed-Satellite Service to employ state of the art full frequency re-use using both horizontal and vertical polarization.[8] PanAmSat also requests, to the extent necessary, a waiver of the full frequency reuse requirements set forth in Section 25.210 of the Commission's rules.[9]

III. DISCUSSION

5. Given the enormous costs of building and operating satellite space stations, the Commission has stated that there should be some assurance that operators will be able to continue to serve their customers.[10] The Commission has therefore stated that, when the orbit location remains available for a U.S. satellite with the technical characteristics similar to the proposed

---

[4] PanAmSat states that it has no specific plans at this time for the Galaxy III-R satellite once it is replaced. PanAmSat Amendment, Question 43.

[5] Service in the Ku-band is provided to only one region or the other at any given time using a set of ground-controlled switches. One set of switches allows Galaxy III-R to receive uplink transmissions at 14.0-14.50 GHz: (i) from the United States; or (ii) from both the United States and anywhere in Latin America. Another set of switches allows the satellite to transmit at 11.7-12.2 GHz either: (i) only to the United States; or (ii) only to Latin America. *See* Hughes Communication Galaxy, Inc., 10 FCC Rcd. 10947 (Int'l Bur. 1995).

[6] *Id.*

[7] The extended C-band uplink can also cross-strap to certain Ku-band downlink transponders.

[8] 47 C.F.R. § 25.210 (e).

[9] 47 C.F.R. § 25.210 (g).

[10] GE Americom Commuications, Inc., For Authority to Construct and Launch its GE-2 Replacement Satellite and to operate it at 85° W.L., 10 FCC Rcd 13775 (Int'l Bur. 1995) (citations omited).

replacement satellite, it will generally authorize the replacement satellite at the same location.[11] The Commission also acts on applications for replacement satellites as they are filed, without consolidating them into a processing group.[12]

6. All applicants must demonstrate technical, legal and financial qualifications to hold a space station license.[13] PanAmSat's legal and technical qualifications are evidenced by its well documented experience and that of its predecessors-in-interest in establishing and operating a satellite system. The Commission has on several occasions found that PanAmSat possesses the necessary legal qualifications to be a Commission licensee. With respect to financial qualifications, PanAmSat provided a balance sheet and income statements of its parent, Hughes Electronic Corporation ("HEC"), demonstrating adequate funds to finance the construction, launch, and operation for one year of Galaxy III-C. HEC's balance sheet as of December 31, 2000 shows total current assets of $4.1 billion which is more than adequate to cover PanAmSat's estimated cost of $248.8 million to construct, launch, and operate Galaxy III-C for one year.[14]

7. Request to Operate in the 13.75-14.0 GHz Band. PanAmSat also proposes to operate Galaxy III-C in the 13.75-14.0 GHz frequency band. The 13.75-14.0 GHz band has been allocated domestically and internationally to the fixed-satellite service subject to restrictions embodied in footnotes to the domestic and international tables of frequency allocations. Because the 13.75-14.0 GHz band is shared on a primary basis with Government radiolocation and with the forward space-to-space and space-to-Earth links of the NASA Tracking and Data Relay Satellite (TDRS) System in the space research service, earth stations in the United States and its possessions operating with the Galaxy III-C satellite will require coordination through the National Telecommunications and Information Administration (NTIA) Interdepartment Radio Advisory Committee's (IRAC) Frequency Assignment Subcommittee (FAS).[15] In this regard, we have received a letter from the NTIA requesting that we identify these requirements in any grant of authority to operate a satellite in the 13.75-14.0 GHz band.[16]

8. Domestically, footnotes US337, US356, and US357 are applicable. Footnote US337 to the U.S. Table of Frequency Allocations was specifically adopted because TDRS

---

[11] Columbia Communications Corporation, Authorization to Launch and Operate a Geostationary C-Band Replacement Satellite in the Fixed-Satellite Service at 37.5° W.L., *Memorandum Opinion and Order*, 16 FCC Rcd 20176 (Int'l Bur. 2001).

[12] GE Americom, 10 FCC Rcd at 13776.

[13] 47 C.F.R. §§25.114, 25.140.

[14] An applicant relying on internal financing must submit a balance sheet documenting current assets and operating income sufficient to cover its costs. Current assets -- which include cash, inventory, and accounts receivable -- provide a general measure of a company's ability to raise funds on the basis of its on-going operations. *See* 47 C.F.R. § 25.114(c)(13).

[15] *See* Amendment of Parts 2, 25, and 90 of the Commission's Rules to Allocate the 13.75-14.0 GHz Band to the Fixed-Satellite Service, ET Docket No. 96-20, Report and Order, 11 FCC Rcd 11951, 11960-61 para. 20 (1996).

[16] *See* Letter from William Hatch, Acting Associate Administrator, Office of Spectrum Management, NTIA, to Roderick Porter, Acting Chief, International Bureau, FCC (May 11, 1999).

operations in this band support manned spaceflight.[17] Footnotes US356 and US357 place certain restrictions on FSS operations.[18] Internationally, footnotes 5.502 and 5.503 to the International Telecommunication Union (ITU) Radio Regulations also place certain restrictions on FSS operations.[19] As US356 and US357 have been adopted domestically, the parallel footnotes in the ITU Radio Regulations (*i.e.*, footnotes 5.502 and 5.503) have been removed from the U.S. Table of Frequency Allocations. The fundamental difference between the U.S. and international footnotes is that international footnote 5.503 places e.i.r.p. density restrictions for protection of data relay services in six megahertz of bandwidth (13.772 - 13.778 MHz), whereas U.S. footnote US357 extends to ten megahertz (13.77 - 13.78 MHz) the bandwidth where these restrictions apply. We require that earth stations in the United States and its possessions (U.S. & P) operate in accordance with U.S. footnotes US356 and US357. For earth stations not in the U.S. & P accessing the Galaxy III-C satellite, we require operation to be consistent with international footnotes 5.502 and 5.503. We further require that non-US&P operation with the Galaxy III-C satellite in the four additional MHz with e.i.r.p. density restrictions under the U.S. footnote to be coordinated with the NASA TDRS system. In the absence of a mutually acceptable coordination agreement with the NASA TDRS system forward space-to-space link within the additional four megahertz highlighted above, the operation of the Galaxy III-C satellite network outside the US&P in the entire 13.77 - 13.78 MHz band will be subject to U.S. footnote US357.

9. While the dates in ITU Radio Regulation footnote 5.503A have passed,[20] NTIA notes that NASA's Tropical Rainfall Measuring Mission (TRMM) satellite system radar in the band 13.793-13.805 GHz is still operating.[21] Since TRMM is a highly valuable and visible U.S. asset, with a broad range of international users, NTIA has requested cooperation from the

[17] Footnote US337 requires that earth stations operating in the 13.75-13.8 GHz band be coordinated through the National Telecommunications and Information Administration (NTIA) Interdepartment Radio Advisory Committee's Frequency Assignment Subcommittee to minimize interference to the forward space-to-space link of the National Aeronautics and Space Administration Tracking and Data Relay Satellite System. 47 C.F.R. § 2.106 US337.

[18] Footnote US356 places a restriction minimum antenna size of 4.5 meters for earth stations operating in the 13.75-14.0 GHz band and indicates a minimum equivalent isotropically radiated power ("e.i.r.p.") that should be used. Footnote US357 limits FSS earth station e.i.r.p. spectral density in the 13.77-13.78 GHz band until those geostationary space stations in the space research service for which advance publication information was received by the ITU prior to 31 January 1992 cease to operate in this band.

[19] Footnote 5.502 to the ITU Radio Regulations places certain restrictions on the minimum equivalent isotropically radiated power ("e.i.r.p.") and minimum antenna size for earth stations operating in the 13.75-14.0 GHz band. Footnote 5.503 limits FSS earth station e.i.r.p. spectral density in the 13.772-13.778 GHz band until those geostationary space stations in the space research service for which advance publication information was received by the ITU prior to 31 January 1992 cease to operate in this band

[20] Footnote 5.503A states that: "Until 1 January 2000, stations in the fixed-satellite service shall not cause harmful interference to non-geostationary space stations in the space research and Earth exploration-satellite services. Additionally, when planning earth stations in the fixed-satellite service to be brought into service between 1 January 2000 and 1 January 2001, in order to accommodate the needs of spaceborne precipitation radars operating in the band 13.793-13.805 GHz, advantage should be taken of the consultation process and the information given in Recommendation ITU-R SA.1071."

[21] *See* Letter from Frederick R. Wentland, Acting Associate Administrator, Office of Spectrum Management, NTIA, to Don Abelson, Chief, International Bureau, FCC (February 28, 2002).

FCC and non-Federal Government entities in providing assistance in reducing interference with the TRMM radar.[22] NTIA notes that it desires that FSS earth stations in the 13.793 - 13.805 GHz frequency band located south of 39º North Latitude and east of 110º West Longitude operate with emission levels below -150 dBW/600 kHz at the TRMM space station receiver. As this is a request and not a requirement, considering the secondary nature of the TRMM operation, we urge, but do not require, operators of earth stations accessing the Galaxy III-C satellite in the 13.75-14.0 GHz band to cooperate voluntarily with NASA in order to facilitate continued operation of the TRMM satellite. NTIA also notes that none of the other space-based radar operations covered by 5.503A will seek continued cooperation in this respect.[23]

10. Request to Operate in the 11.45-11.7 GHz Band. We note that the 11.45-11.7 GHz frequency band in which PanAmSat proposes to operate is allocated to terrestrial services and the FSS on a co-primary basis.[24] FSS operations in this band, however, are limited to international service.[25] Thus, PanAmSat can only downlink in the U.S. in the 11.45-11.7 GHz frequency band if the corresponding uplink, in any frequency band ,originates outside the U.S. Accordingly, no earth stations proposing to operate in the 11.45-11.7 GHz band will be licensed for U.S. domestic service, *i.e.* where the corresponding uplink in any frequency band also originates in the U.S. We note that Galaxy III-C has transponders operating in the 11.45-11.7 GHz band that are specifically intended to serve Puerto Rico, and that the corresponding uplink transmissions will originate in North America.[26] We remind PanAmSat that consistent with the requirement to provide only international services in the 11.45-11.7 GHz band, any earth stations in Puerto Rico that receive transmissions in this band can do so only if the corresponding uplink originates outside the U.S.

11. In the 11.45-11.7 GHz frequency band the Commission requires that the downlink power flux density (pfd) levels of carriers at the earth's surface not exceed the levels specified in Section 25.208(b) of the Commission's rules for various elevation angle ranges.[27] For the proposed Galaxy III-C spacecraft, PanAmSat has calculated pfd levels for beams operating in the 11.45-11.7 GHz frequency band at 0º, 5º, 25º and 90º elevation angles, for both

---

22 *Id.*

23 *Id.*

24 Allocation of a given frequency band for a particular service on a primary basis entitles operators to protection against harmful interference from stations of "secondary" services. Further, secondary services cannot claim protection from harmful interference caused by stations of a primary service. *See* 47 C.F.R. §§ 2.104(d) and 2.105(c).

25 Use of the band by the FSS domestically in the United States is subject to certain restrictions. Specifically, Non-Government footnote NG104 to the U.S. Table of Frequency Allocations states that the use of the bands 10.7-11.7 GHz in the fixed-satellite service is limited to international systems, i.e. "other than domestic systems." The Commission interpreted this language to mean that U.S.-licensed systems may use the 10.7-11.7 GHz band to provide international service only. *See PanAmSat Licensee Corp*., FCC Rcd. 7725 (Int'l Bur. 1999).

26 The Galaxy III-C's Puerto Rico Beam operates on the 1K and 3K transponders with center frequencies 11.48088 GHz and 11.51004 GHz, respectively. Corresponding uplinks are on either the Ku-band 1K and 3K transponders, or the extended C-band 1E and 3E transponders.

27 *See* 47 C.F.R. §25.208(b).

analog (TV/FM) and digital carrier types. The results show that the pfd levels could be exceeded in certain cases. In the case of the Puerto Rico transmit beam at 90º elevation angle, the pfd limit could be exceeded by as much as 7.5 dBW/m^2/4kHz.[28]

12. PanAmSat states in an amendment to its application that it will take all necessary steps, such as employing continuous video modulation with its TV/FM carriers to ensure that all transmissions emanating from the proposed spacecraft will meet the pfd limits contained in section 25.208 of the Commission's rules. In addition, PanAmSat has provided the Commission with supplemental technical information addressing this issue.[29] In this supplemental information, PanAmSat stresses that the scenarios cited in the January 2000 application were "worst case" and offers operational options available to maintain the pfd levels of the spacecraft transmission within acceptable limits. These include limiting the transmissions on the Puerto Rico Beam to only those transmissions that would comply with the requisite pfd limits, *e.g*., digital transmissions. (Presumably, this option could be applied to the Latin American Beam which at 90º elevation angle is also predicted to exceed the pfd limits of §25.208.) A second method proposed by PanAmSat would be to employ video modulation with the "possible addition of an energy spreading signal." PanAmSat states that if this method or any other non-e.i.r.p. reduction methods that might become available in the future do not result in compliance with the pfd limits of §25.208, the PanAmSat would reduce the downlink e.i.r.p. to the appropriate level necessary to achieve compliance.

13. Section 25.211(b) of our rules requires that all transmissions operating in frequency bands described in §25.208(b) and (c) (*i.e*., 11.45-11.7 GHz) shall also contain an energy dispersal signal at all times with a minimum peak-to-peak bandwidth set at whatever value is necessary to meet the power flux density limits specified in §25.2508(b) and (c). Accordingly, we remind PanAmSat that it is required to employ such an energy dispersal signal *at all times* when transmitting downlink analog video signals in the 11.45-11.7 GHz frequency band.

14. In addition, PanAmSat has not provided any technical analysis demonstrating the efficacy of its proposal to use continuous video modulation to ensure compliance with the pfd limits of Section 25.208. We are not convinced that continuous video modulation, even in the presence of a typical energy dispersal signal, will be entirely effective, particularly when the pfd excesses are as great as 7.5 dB. Accordingly, we require PanAmSat to operate by whatever means necessary within the downlink power flux density limits specified in Section 25.208(b). This includes, when needed, a reduction in its transmitted downlink e.i.r.p.

15. Request to Operate in the Extended C-Band (6425-6675 MHz). PanAmSat proposes to uplink in the 6425-6675 MHz frequency band. Section 25.202(a) of the Commission's Rules does not specifically list the 6425-6675 MHz portion of the extended C-Band among the bands available for satellite licensing. However, under section 25.202(b) of our Rules, this band may be licensed on a case-by-case basis to space systems in conformance with Section 2.106 and the Commission's rules and policies.[30] It should be noted, though, that the 6425-6675 MHz band requested by Galaxy III-C is shared with and used by a number of

[28] PanAmSat Amendment to application, Exhibit 9.

[29] PanAmSat technical supplement dated February 4, 2002, p. 2-3

[30] 47 C.F.R. § 25.202. The domestic frequency allocation table allocates the bands 6425-6525 MHz and 6525-6725 MHz to the fixed satellite service on a co-primary basis. 47 C.F.R. § 2.106.

terrestrial services domestically.[31] Specifically, the frequency range 6425-6525 MHz is used by the mobile service under Parts 74, 78 and 101, including for aeronautical mobile and mobile remote pickup operations.[32] The frequency range 6525-6725 MHz is heavily used by the fixed service under Part 101.[33]

16. While the extended C-band is used by terrestrial operations in the United States and the continued growth of the band by terrestrial services is anticipated and essential, the co-primary allocation for FSS has long been acknowledged[34] and we recognize the value of this additional spectrum for the Galaxy III-C satellite. Though deployment of a significant number of earth station uplinks may be difficult in the United States, this authorization will allow earth stations to access the Galaxy III-C satellite in the extended C-Band in other countries where earth station deployment and coordination may not be as difficult.[35] However, due to domestic coordination and sharing issues, we emphasize that our decision to authorize Galaxy III-C for a satellite license to use the 6425-6675 MHz portion of the extended C-Band does in no way prejudge any decision on access to that band by U.S. earth stations seeking to uplink to the Galaxy III-C satellite.[36] Similarly, our decision today is not intended to change in any way conditions for accessing the band by the terrestrial services.

---

[31] Conversely, the 6425-6725 MHz band is lightly used by satellite operations in the United States.

[32] At present there are 211 licenses for operations in the 6425-6525 MHz under Parts 74 and 101. Approximately 35 percent of these licenses are for channels on a nationwide basis, which allows the broadcast news gathering community, with proper coordination, to cover news worthy events across the country on an as-needed basis. Pursuant to Part 78, the Commission also has licensed 13 mobile cable television relay service (CARS) stations in the 6425-6525 MHz band, mostly in major metropolitan areas including New York, Chicago, Phoenix, and Miami. While these 13 mobile stations are licensed to a particular community, they can be used anywhere in the United States with 24-hour advance notice to the Commission.

[33] The 6525-6825 MHz band, which includes a portion of the extended C-Band requested by Galaxy III-C, is used by the fixed, point-to point community with 14,238 links presently licensed. It is our understanding that many fixed service licensees have relocated to the extended C-Band from the 2 GHz band and from other parts of the C-Band due to congestion arising from sharing with satellite and other terrestrial fixed operations.

[34] *See, e.g. Establishment of a Spectrum Utilization Policy for the Fixed and Mobile Services' Use of Certain Bands Between 947 MHz and 40 GHz*, Third Report and Order, 52 FR 7136 (1987) (adopting rules setting limitations to minimize the probability of harmful interference to reception by satellites in the 6425-6825 MHz frequency bands).

[35] We note that the applicant has stated that it does not anticipate that this satellite will be accessed by more than a handful of earth stations in the extended-C band. Letter to Thomas Tycz, Chief, Satellite Division, from Henry Goldberg, Attorney for PanAmSat Corporation (May 6, 2002).

[36] We recognize that one of the primary purposes of the Galaxy III-C satellite is to serve the Latin America market. Consequently, our decision today is not intended to impact in any way the ability of earth stations sited in other countries to access the Galaxy III-C satellite. We also note that the applicant has clarified in the record that it is aware of its obligations to coordinate with incumbent licensees and that this grant does not prejudge any future decisions regarding earth station applications in the United States. Letter to Thomas Tycz, Chief, Satellite Division, from Henry Goldberg, Attorney for PanAmSat Corporation (May 6, 2002).

17. We authorize the Galaxy III-C satellite in the 6425-6675 MHz band mindful that certain issues associated with earth stations accessing the satellite in this band may be separately addressed, as discussed in part below. The Commission just concluded a proceeding that addressed a number of sharing issues between a new allocation for Mobile Satellite Service (MSS) feeder links and terrestrial fixed and mobile operations in the upper portion of the extended C-Band, 6875-7025 MHz.[37] We believe that some of the coordination issues discussed therein are applicable to our decision today. For example, future earth stations seeking to access Galaxy III-C, because of their co-primary status, will need to protect incumbent terrestrial facilities through a coordination process.[38] It also was noted in the *MSS Report and Order* that there are a number of other proceedings in which the Commission is evaluating issues related to satellite and terrestrial fixed coordination in several frequency bands, including those at issue herein.[39] Consequently, with respect to the 6525-6675 MHz segment of the extended C-band, which is shared between fixed and fixed satellite services, we carry forth the Commission's decision in the *MSS Report and Order* that "existing coordination rules found in Parts 25 and 101 of our rules are adequate to address immediate coordination concerns … and that the issues raised in separate proceedings can be applied uniformly across all bands as appropriate."[40] Subject to future Commission decisions, we thus will require applicants for earth stations seeking to access the Galaxy III-C in the 6525-6675 MHz band to coordinate with terrestrial fixed services in accordance with Section 25.203 of the Commission's Rules prior to submitting an application to the Commission.[41]

18. The Commission stated in the *MSS Report and Order* that sharing between the mobile, including aeronautical mobile, and satellite services in the 6875-7025 MHz band can be much more difficult because of the mobile service.[42] It added that a future proceeding would address how coordination is to be achieved between satellite and mobile television pickup operations and that the Commission would place any appropriate *ad hoc* coordination requirements on any gateway authorizations that are requested prior to the completion of that proceeding.[43] In light of the considerations in the *MSS Report and Order,* we note that the technical rules that were intended to allow terrestrial stations to share fixed-satellite service uplink bands in the 6425-6825 MHz band were adopted in 1987 and may need to be updated. Therefore, any requests for authorization for uplink earth stations in the 6425-6525 MHz band

---

[37] *See, e.g., Amendment of Parts 2, 25 and 97 of the Commission's Rules with Regard to the Mobile-Satellite Service Above 1 GHz*, ET Docket No. 98-142, *Report and Order*, FCC 02-23 (released February 7, 2002) *(MSS Report and Order*). *Compare Amendment of Parts 2 and 90 of the Commission's Rules to Allocate the 5.850-5.925 GHz Band to the Mobile Service for Dedicated Short Range Communications of Intelligent Transportation Services*, ET Docket No. 98-95, FCC 99-305, ¶ 15 (released October 22, 1999).

[38] *See id.* at ¶ 48.

[39] *Id.* at ¶ 53.

[40] *Id.* at ¶ 54.

[41] *See* 47 C.F.R. § 25.203.

[42] *Id.* at ¶ 55. We note that mobile licensing in the 6425-6525 MHz band also is unique in that some mobile licensees receive nationwide authorizations and coordinate actual operations with other terrestrial licensees through local coordinators as mobile service needs dictate.

[43] *Id.* at ¶ 57.

will continue to be subject to coordination pursuant to Section 25.203(c) of the Rules,[44] but operators should be aware that we may need to place appropriate *ad hoc* license obligations on any future requests for earth station authorization for uplinks pending a future rulemaking proceeding addressing any additional coordination requirements in this band.

19. PanAmSat's Waiver Request. Part 25 of our rules sets out technical requirements for earth and space stations in the Fixed-Satellite Service. In particular, Section 25.210(e) requires, in part, that space stations in the Fixed-Satellite Service employ state-of-the-art full frequency re-use using both horizontal and vertical polarization.[45] PanAmSat requests a waiver of Section 25.210(e) of the Commission's rules so that it may employ circular polarization on some of its Ku-band transponders.[46] Section 25.210(g)(2) of the Commission's rules requires that satellites providing international service be configured so that all assigned frequencies (in both polarizations) could be reused in beams serving widely separate areas. PanAmSat requests, to the extent necessary, a waiver of the full-frequency reuse requirements of Section 25.210.

20. The intent of §25.210(g)(2) is to achieve full frequency reuse in beams serving widely separated areas. The Galaxy III-C satellite cannot meet this requirement. Specifically, Galaxy III-C does not reuse all frequencies in the horizontal polarization in the uplink of its North-South America beam, or in the left-hand-circular polarization in the downlink of its South America beam.[47] In response to an inquiry from the Commission, PanAmSat further clarified that "although the C-band payload on Galaxy III-C, and the Ku-band payload with the exception of the 11.95-12.2 GHz transponders, use circular or linear polarization to achieve full frequency reuse, there are some frequencies on the 11.95-12.2 GHz South American and North South America beams that are not fully duplicated."[48]

21. In support of its waiver request, PanAmSat states, among other things, that "Galaxy III-C is a BSS 702, one of the largest satellites ever built for commercial use"[49] and "the largest satellite PanAmSat has ever launched."[50] PanAmSat asserts that "adding the four channels that are not duplicated to the Ku-band payload, although technically feasible, would have put additional strain on the power budget for the satellite."[51] PanAmSat maintains that it

---

44 *See* 47 C.F.R. § 25.203(c)(5).

45 47 C.F.R. § 25.210(e).

46 *See* Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to William F. Caton, Secretary, FCC (March 21, 2002) ("Waiver Request"). PanAmSat's request was placed on public notice and no comments were received. *See* Report No. SAT-000106, March 25, 2002.

47 These frequencies are 11.948-11.963 GHz, 11.987-12.023 GHz, 12.047-12.083 GHz, 12.107-12.143 GHz and 12.167-12.182 GHz. We recognize that these frequencies are fully reused in transponders on Galaxy III-C's North America beam. *See* PanAmSat Amendment, Exhibit 1A.

48 Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to William F. Caton, Secretary, FCC (May 13, 2002).

49 *Id.*

50 *Id.*

51 *Id.*

"would have had to choose between not being able to activate all of the satellite's bandwidth at the same time and adding batteries and solar cells to a satellite that is as loaded as PanAmSat would like given PanAmSat's relatively brief operational history with satellites of this size."[52] PanAmSat states further that "some early 702s have in fact faced power problems"[53] and notes that it has had problems with solar panels and batteries on other, non-702 satellites.[54] For these reasons, PanAmSat requests a waiver, to the extent necessary, of the full frequency reuse requirements set forth in § 25.210 of the Commission's rules.[55]

22. The Commission may waive a rule for good cause shown.[56] Waiver is appropriate if special circumstances warrant a deviation from the general rule and such deviation would better serve the public interest than would strict adherence to the general rule.[57] Generally, the Commission may grant a waiver of its rules in a particular case if the relief requested would not undermine the policy objective of the rule in question and would otherwise serve the public interest. [58] Under these particular circumstances, we find that a waiver of the full frequency reuse requirements set forth in Section 25.210(g)(2), in a limited amount of bandwidth, will serve the public interest. We understand PanAmSat's desire to be cautious with regard to the power budget on its spacecraft, particularly in light of the past problems it has experienced both on some early Boeing Satellite Systems (BSS) 702 model satellites and on other PanAmSat (non-BSS 702) satellites.[59]

23. PanAmSat also asserts that it is in the public interest to grant a waiver of § 25.210(e) of our rules to permit its use of circular polarization on some of its Ku-band transponders[60] for services to geographic areas outside the United States. PanAmSat asserts that a waiver of the linear polarization requirement to these geographic areas will prevent loss of service to an existing DIRECTV Latin America (DLA) customer base that is already using earth stations configured to receive circularly polarized transmissions in these geographic areas. PanAmSat

---

52 *Id.*

53 *Id.* at 2.

54 *Id.*

55 *Id.*

56 47 C.F.R. § 1.3.

57 *Northeast Cellular Telephone Co. v. FCC,* 897 F.2d 1166 (D.C. Cir. 1990).

58 *Wait Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969); *Dominion Video Satellite, Inc.*, Order and Authorization, 14 FCC Rcd 8182 (Int'l Bur. 1999).

59 For example, in September 2001 when emerging from a solar eclipse, the PAS-7 satellite experienced a solar cell short-circuit resulting in a sudden, permanent loss of power.

60 The sixteen 11.45-11.7 GHz transponders in the satellite's Latin America beam use circular polarization, as do the twelve 11.95-12.2 GHz transponders in the South America beam. *See* PanAmSat Waiver Request dated March 21, 2002, fn 1.

states that the "Galaxy III-C is in part a replacement for the Galaxy III-R[61] and in part a replacement for Galaxy VIII(I)."[62] The Galaxy VIII(I) satellite is located at 95º W.L. and provides service with circular polarization to Mexico, the Caribbean, South America and Central America at 13.75-14.0 GHz (uplink) and 11.45-11.95 GHz (downlink).[63] According to PanAmSat, the proposed "Ku-band transponders on Galaxy III-C that are circularly polarized will replace transponders on Galaxy VIII(I)[64] that PanAmSat's customer, DIRECTV Latin America, uses to provide direct-to-home services in Latin America."[65]

24. In light of the Commission's recent authorization of the Galaxy VIII(I)-R[66] satellite network to operate at the 95° W.L orbital location, PanAmSat has clarified its initial justifcation for using circularly polarized transponders on the Galaxy III-C satellite.[67] PanAmSat was granted a waiver to operate circularly polarized transmissions on the Galaxy VIII(I)-R satellite, on beams covering South America, Mexico and the Caribbean in the 11.45-11.95 GHz band to replace circularly polarized transponders on Galaxy VIII(I) used by PanAmSat's customer, DLA, to serve the direct-to-home services market in Latin America.[68] Since circularly polarized transmissions are already available on the Galaxy VIII(I)-R satellite in the 11.45-11.95 GHz band in Latin America, this capacity is not required on Galaxy III-C in order to ensure continued service to DLA's customers. PanAmSat acknowledges that the 11.45-11.7 GHz payloads on the Galaxy III-C and Galaxy VIII(I)-R satellites "serve the same areas; could not be operated at the same time without causing harmful interference; and are intended to be a

---

[61] The Galaxy III-R satellite is authorized to provide service in the 11.7-12.2 GHz bands using linear polarization in the United States or circular polarization in Latin America. Service is provided only to one region or the other at any given time using a set of ground-controlled switches. The Commission recognized the public interest benefit in providing digital video distribution in Latin America using circularly polarized transmissions, but required that operation for domestic use must use linear polarization. *See*, Hughes Communication Galaxy, Inc., 10 FCC Rcd. 10947 (Int'l Bur. 1995).

[62] *See* Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to William F. Caton, Secretary, FCC (March 21, 2002).

[63] *See PanAmSat Licensee Corp.*, 12 FCC Rcd 20345 (Int'l Bur. 1997).

[64] The Galaxy VIII(I) provides circularly polarized transmissions to Latin America in the 11.45-11.95 GHz downlink band. PanAmSat is proposing to replace these services with circularly polarized transmission in Galaxy III-C's 11.45-11.7 GHz downlink band (Latin America and Puerto Rico beams); PanAmSat is not proposing to operate circularly polarized transponders in Galaxy III-C's 11.7-11.95 GHz downlink band. In addition, DLA customers do not at present receive programming in the 11.95-12.2 GHz band, in which PanAmSat also seeks authorization to use circularly polarized transponders.

[65] Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to Marlene Dortch, Secretary FCC (March 21, 2002). *See also*, Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to Marlene Dortch, Secretary FCC (May 17, 2002) in which PanAmSat clarifies that only the 11.45-11.7 GHz circularly polarized transponders on Galaxy III-C will replace those on the Galaxy VIII(I) that are now providing service to DLA customers.

[66] *See PanAmSat Licensee Corp.*, DA 02-1068, released May 8, 2002.

[67] Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to Marlene Dortch, Secretary FCC (May 17, 2002)

[68] *See PanAmSat Licensee Corp.*, DA 02-1068, released May 8, 2002 at para. 14.

substitute for one another."[69] Thus, in case of a failure of either satellite, PanAmSat would use the 11.45-11.7 GHz frequency band on the other satellite.

25. As for PanAmSat's use of circularly polarized transponders in the 11.95-12.2 GHz frequency band, we note that this band is not included on the Galaxy VIII(I)-R satellite, and PanAmSat acknowledges that at present DLA customers do not receive programming in the 11.95-12.2 GHz band.[70] PanAmSat argues that "the circularly polarized earth stations that the customers use to receive programming in the 11.45-11.7 GHz band, however, already are capable of downlinking circularly polarized signals in the 11.95-12.2 GHz band."[71] PanAmSat asserts that it needs to use circular polarization on Galaxy III-C's 11.95-12.2 GHz payload, "in order to provide service in the polarization mode in which the installed base of earth stations is designed to operate."[72] According to PanAmSat, if it were required to use linear polarization in the 11.95-12.2 GHz band on Galaxy III-C, "DLA's customers would be subject to lost or degraded service unless DLA installed linear polarization receive equipment in over one million dishes, which would be prohibitively expensive."[73]

26. The Commission has previously recognized that the delivery of video programming to Latin America using circularly polarized Ku-band transmissions was in the public interest.[74] We recognize that there is a large existing customer base already using earth stations configured to receive circularly polarized transmissions that could receive transmissions from the Galaxy III-C circularly polarized transponders in both the 11.45-11.7 GHz and 11.95-12.2 GHz bands. Although in the 11.45-11.7 GHz band, customers can now be served by the Galaxy VIII(I)-R satellite, we recognize the benefit to customers of the availability of in-orbit back-up capability. Under these circumstances, we find that a waiver of the linear polarization requirement of Section 25.210(e) of our rules is in the public interest. Grant of a waiver of Section 25.210(e) allows DLA's existing customer base using earth stations configured to receive circularly polarized signals, to receive circularly polarized transmissions from Galaxy III-C in both the 11.45-11.7 GHz and 11.95-12.2 GHz bands. This will promote continuity of service in case of a failure of circularly polarized transponders on Galaxy VIII(I)-R operating in the 11.45-11.7 GHz frequency band[75] and allow for an expansion of service to existing customers with circularly polarized earth stations.

---

[69] Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to Marlene Dortch, Secretary FCC (May 17, 2002).

[70] *Id.*

[71] *Id*.

[72] *Id.*

[73] *Id.*

[74] *See* Hughes Communication Galaxy, Inc., 10 FCC Rcd. 10947 (1995).

[75] This justification would also apply if PanAmSat chose to operate the 11.45-11.7 GHz frequency band on the Galaxy III-C satellite while using Galaxy VIII(I)R as a back-up.

27. We remind PanAmSat, however, that we are authorizing Galaxy III-C to operate certain beams in the extended Ku-band frequencies to replace, in part, services that are available to DLA customers on the Galaxy VIII(I) satellite. We do so with the understanding that PanAmSat will not operate the co-frequency, co-coverage, co-polarized transmissions at the same time on both the Galaxy III-C and Galaxy VIII(I)-R satellites located at 95° W.L.[76] We also remind PanAmSat that both previous Orders authorizing circularly polarized transmissions on Galaxy satellites at 95º W.L. did so *only* for non-domestic services.[77] Accordingly, the circularly polarized transponders on the Galaxy III-C satellite may only provide service to Latin America, *i.e.,* Mexico, the Caribbean, Central America and South America. Moreover, any earth stations in the United States or its Possessions, including Puerto Rico, that receive circularly polarized transmissions from Galaxy III-C, may do so only if the corresponding uplink (in any frequency band) originates outside of the United States.

28. In addition, in granting this waiver request, we remind PanAmSat that, consistent with our rules, given the non-conforming design of its satellite, PanAmSat must protect the routinely licensed services of other two-degree-spacing compliant satellite networks serving the United States. In addition, PanAmSat must coordinate its non-compliant services with the non-compliant services of other satellite networks authorized by the United States or authorized to serve the United States on an equal basis.

29. Request for In-Orbit Testing. We also grant PanAmSat's request for special temporary authority (STA) for up to ninety days to conduct in-orbit testing (IOT) of the Galaxy III-C satellite at the 76.5 ° W.L. orbital location.[78] Grant of the STA will allow PanAmSat to complete in-orbit testing without disrupting ongoing service at 95° W.L. PanAmSat states that grant of the requested STA presents no risk of interference to other authorized users. According to PanAmSat, the closest adjacent satellites operating in the C-band and/or Ku-band are HGS-5 at 77° W.L., operated by Hughes Global Systems; Satcom C1 (C-band only) and AMC-5 (Ku-band only) at 79° W.L., operated by SES Americom; SBS-6 & Galaxy VI at 74° W.L., operated by PanAmSat; and Nahuel-1 at 71.8° W.L., operated by Nahuelsat. In addition, PanAmSat states that it has successfully coordinated with the operators of these adjacent satellites.

---

[76] Many of the proposed transmissions on the Galaxy III-C satellite would operate at the same frequencies and polarizations, and cover the same service areas as those already authorized for the Galaxy VIII(I)-R satellite. For example, in the 13.75-14.0 GHz uplink band, Galaxy III-C transmissions on the North America and North-South America uplink beams cannot operate simultaneously with vertically polarized transmissions on the North America/Mexico beam and with horizontally polarized transmissions on the South America beam, respectively, on the Galaxy VIII(I)-R. Similarly, in the 11.45-11.7 GHz downlink band, transmissions on Galaxy III-C's Latin America beams cannot operate simultaneously with transmissions on the Galaxy VIII(I)-R's West-South America beam

[77] *See* Hughes Communication Galaxy, Inc., 10 FCC Rcd. 10947 (Int'l Bur. 1995), in which we required that Hughes must use linear polarization for domestic use. *See* also, *PanAmSat Licensee Corp.*, 12 FCC Rcd 20345 (Int'l Bur. 1997) in which the Commission recognized that Galaxy VIII(I)'s use of the 11.45-11.7 GHz band was for international use only.

[78] Letter from Joseph A. Godles, Attorney for PanAmSat Corporation, to William Caton, Secretary, FCC (April 1, 2002).

30. Grant of the STA is conditioned on Galaxy III-C not causing harmful interference to any lawfully operating in-orbit satellites. PanAmSat shall cease testing operations immediately upon notification of such interference. Moreover, PanAmSat's testing of the extended C and Ku-band frequencies discussed above must comply with the conditions set forth in the order for its regular operation using those frequencies.

IV. CONCLUSION AND ORDERING CLAUSES

31. As set forth above, PanAmSat possesses the requisite legal, financial, and technical qualifications to launch and operate the Galaxy III-C satellite. We also find that a grant of PanAmSat's application, subject to the conditions set forth herein, will serve the public interest by ensuring continuity of service to its customers.

32. Accordingly, IT IS ORDERED that PanAmSat's application, File Nos. SAT-LOA-19990812-00082, SAT-AMD-20020111-0004, and SAT-WAV-20020321-00026 IS GRANTED and PanAmSat is authorized to launch and operate its Galaxy III-C satellite at the 95° W.L. orbit location in accordance with the terms, conditions, and technical specifications set forth in its application.

33. IT IS FURTHER ORDERED that PanAmSat's request for special temporary authority, File No. SAT-STA-20020404-00047, to conduct in-orbit testing of the Galaxy III-C satellite at 76.5 ° W.L. for a period of ninety days from the launch of the Galaxy III-C satellite is GRANTED. PanAmSat's testing of the Galaxy III-C satellite at the 76.5° W.L. location must also comply with the conditions set forth in this Order and Authorization for operation of the Galaxy III-C satellite at the 95° W.L. orbital location. Operation of Galaxy III-C shall not cause harmful interference to any lawfully operating in-orbit satellites and PanAmSat shall cease operations immediately upon notification of such interference during this period of testing.

34. IT IS FURTHER ORDERED that, PanAmSat shall prepare the necessary information, as may be required, for submission to the ITU to initiate and complete the advance publication, international coordination, and notification process of this space station in accordance with the ITU Radio Regulations. We also note that no protection from interference caused by radio stations authorized by other administrations is guaranteed unless coordination procedures are timely completed or, with respect to individual administrations, by successfully completing coordination agreements. Any radio station authorization for which coordination has not been completed may be subject to additional terms and conditions as required to effect coordination of the frequency assignments of other administrations. *See* 47 C.F.R. § 25.111(b).

35. IT IS FURTHER ORDERED that in the 13.75-14 GHz band, all earth stations in the United States and its possessions are required to coordinate through NTIA's Interdepartment Radio Advisory Committee's Frequency Assignment Subcommittee.

36. IT IS FURTHER ORDERED that the operation of the Galaxy III-C satellite network in the 13.75-14.0 GHz band shall be in accordance with footnotes US356 and US357 to 47 C.F.R. § 2.106 in the United States and its posessions and footnotes 5.502 and, subject to coordination with IRAC, 5.503 to the ITU Radio Regulations outside of the United States and its possessions. In addition, in the absence of a separate coordination agreement with the forward

space-to-space link of the NASA TDRS system operating in the 13.75-14.0 GHz frequency band, U.S. footnote US357 will apply to non-United States operation of the Galaxy III-C satellite network in the 13.77 - 13.78 GHz band.

37. IT IS FURTHER ORDERED that PanAmSat shall operate by whatever means necessary within the downlink power flux density limits specified in §25.208(b) of the Commission's rules, including, when necessary, a reduction in its transmitted downlink e.i.r.p.

38. IT IS FURTHER ORDERED that PanAmSat's use of the 11.45-11.7 GHz frequency band shall comply with the terms of Footnote NG104 which permits use of this downlink frequency for international service only, *i.e.* where the corresponding uplink does not originate in the United States.

39. IT IS FURTHER ORDERED that, given the non-conforming design of its satellite, PanAmSat must protect the routinely licensed services of other satellite networks either licensed by the United States or authorized to serve the United States. PanAmSat must also coordinate its non-compliant services with the non-compliant services of other satellite networks licensed by the United States or authorized to serve the United States on an equal basis.

40. IT IS FURTHER ORDERED that PanAmSat shall not operate the co-frequency, co-coverage, co-polarized transmissions, at the same time on both the Galaxy III-C and Galaxy VIII(I)-R satellites located at 95° W.L as stated in paragraph 27 of this Order and Authorization.

41. IT IS FURTHER ORDERED that PanAmSat is obliged to comply with the applicable laws, regulations, rules, and licensing procedures in every country it proposes to serve.

42. IT IS FURTHER ORDERED that the license term for the Galaxy III-C satellite is fifteen years and will begin to run on the date the licensee certifies to the Commission that the satellite has been successfully placed into orbit and its operation fully conforms to the terms and conditions of this authorization.

43. PanAmSat is afforded thirty days from the date of release of this order and authorization to decline this authorization as conditioned. Failure to respond within this period will constitute formal acceptance of the authorization as conditioned.

44. This Order is issued pursuant to Section 0.261 of the Commission's rules on delegated authority, 47 C.F.R. § 0.261, and is effective upon release. Petitions for reconsideration under Section 1.106 or applications for review under Section 1.115 of the Commission's rules, 47 C.F.R. §§ 1.106, 1.115, may be filed within 30 days of the date of the release of this order (*see* 47 C.F.R. § 1.4(b)(2)).

FEDERAL COMMUNICATIONS COMMISSION

Thomas S. Tycz
Chief
Satellite Division